

BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

**In the Matter of the Application of :
Verizon New Jersey Inc. For Approval :
(i) of a New Plan for an Alternative Form:
of Regulation and (ii) to Reclassify Multi-:
line Rate Regulated Business Service as :
Competitive Services, and Compliance :
Filing :**

BPU Docket No. TO01020095

Direct Testimony
of

THOMAS H. WEISS

On Behalf of the
New Jersey Division of the
Ratepayer Advocate

May 15, 2001

1 Q. MR. WEISS, PLEASE STATE YOUR BUSINESS ADDRESS AND OCCUPATION.

2 A. I am an engineer employed as President of Weiss Consulting, Inc. Our business address
3 is 205 E. Spring Street, Fuquay-Varina, NC, 27526.
4

5 Q. WHAT IS YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL
6 EXPERIENCE IN THE PUBLIC UTILITY FILED?

7 A. I am a Registered Professional Engineer with over thirty years of experience in the
8 communications industry. My professional education includes a Bachelor of Science
9 degree in electrical engineering and a Master of Science degree in business management
10 with emphasis in finance and micro economics. My employment experience includes
11 eight years in engineering and financial management positions with a major domestic
12 telecommunications utility, and twenty-two years as an engineering and economic
13 consultant to Federal and state governments, private businesses, and consumer groups.
14

15 My consulting practice has focused on telecommunications technology, management, and
16 regulatory issues, principally as those issues affect the service provided by, and the prices
17 charged for, service by domestic telecommunications utilities, including the former
18 Regional Bell Operating Companies; the former GTE Telephone Operating Companies;
19 AT&T and other interexchange carriers; and various independent telephone companies. I
20 have presented expert testimony on communications engineering matters in both Federal
21 and state courts and (primarily on behalf of regulatory commission staffs) in over one-
22 hundred thirty proceedings before public utility regulators in twenty-four states and the
23 District of Columbia. I have also testified on economic and regulatory issues before the
24 Federal Energy Regulatory Commission.
25

26 Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND
27 OTHER PROFESSIONAL EXPERIENCE IN THE COMMUNICATIONS INDUSTRY.

28 A. I received the Master of Science degree in Business Management from the Duke
29 University Graduate School of Business Administration (now the Fuqua School of
30 Business) in June 1973. I also hold a Bachelor of Science degree in Electrical

1 Engineering granted in January 1970 by North Carolina State University at Raleigh in
2 Raleigh, NC.

3
4 I am a Registered Professional Engineer licensed to practice in Maryland and Missouri; a
5 Member of the Institute of Electrical and Electronic Engineers (IEEE), Communications
6 Society, Computer Society, Network Society; a Member of the National Society of
7 Professional Engineers and the Maryland Society of Professional Engineers, both of the
8 Private Practice Divisions.

9
10 I am the author of *Public Utility Plant Investment Decisions in the Face of Advancing*
11 *Technology and Regulatory Policy Reform*, Proceedings of the 27th Annual Regulatory
12 Conference, Iowa State University, Ames (1988). I was an invited speaker and panel
13 member at the 1984 Public Utilities Conference, University of Georgia College of
14 Business; and at the 1988 Iowa State University Regulatory Conference. I also served as
15 a member of the faculty at the 1989 United States Telephone Association (USTA)
16 Advanced Management Workshop sponsored by the University of Kansas at Lawrence.

17
18 Q. PLEASE BRIEFLY DESCRIBE YOUR WORK HISTORY AS A CONSULTANT IN
19 THE TELECOMMUNICATIONS INDUSTRY.

20 A. In June 1994, I founded Weiss Consulting, Inc. to provide telecommunications technical,
21 management, and economic consulting services to Federal and state governments, to
22 businesses in their capacities as both providers and consumers of telecommunications
23 products and services, and to consumer groups.

24
25 From 1986 to 1994, I was employed as Vice President of Baker G. Clay & Associates,
26 Inc. ("BGC&A"), a public utility consulting firm located in Annapolis, MD. While with
27 BGC&A, I provided technical and economic consulting services to Federal and state
28 governments, to businesses in their capacity as consumers of telecommunications
29 products and services, and consumer groups; and electric and natural gas transportation
30 and distribution services in wholesale and retail markets.

1 From 1978 to 1986, I was employed as Senior Consultant with Hess & Lim, Inc.
2 ("H&L"), a public utility consulting firm headquartered in Greenbelt, MD. My duties
3 and responsibilities at H&L were the same as those described above for BGC&A.
4

5 Q. EARLIER YOU OBSERVED THAT YOUR EMPLOYMENT EXPERIENCE
6 INCLUDES EIGHT YEARS IN ENGINEERING AND FINANCIAL MANAGEMENT
7 POSITIONS WITH A MAJOR DOMESTIC TELECOMMUNICATIONS UTILITY.
8 PLEASE BRIEFLY DESCRIBE THAT EMPLOYMENT EXPERIENCE.

9 A. From January 1970, when I completed my professional education, until June 1978, when
10 I accepted the position with H&L, I was employed by General Telephone Company of
11 the Southeast, a local exchange operating company owned by GTE Corporation, in a
12 series of progressively more responsible management positions as outlined below:

13 1970 - 1973 Supervising Plant Extension Engineer responsible to the General Plant
14 Extension Engineer for development of capital investment deployment
15 plans.

16 1973 - 1975 Alabama Division Engineering Manager responsible to the Vice President
17 for all company plant (land, buildings, inside and outside plant)
18 engineering activity, including capital budget development and
19 administration, for the company's operations in the State of Alabama.

20 1975 - 1976 Revenues and Earnings Manager responsible to the Corporate Director of
21 Revenues and Earnings for development and administration of rates,
22 tariffs, and rate filings before the FCC and regulatory bodies in three state
23 jurisdictions.

24 1977 - 1978 Corporate Budgets and Results Manager responsible to the Vice President
25 of Operations for development and administration of seven-state telephone company
26 operating expense budget.
27

28 Q. PLEASE BRIEFLY DESCRIBE YOUR EXPERIENCE AS AN EXPERT WITNESS.

29 A. I have presented expert testimony on communications engineering matters in both
30 Federal and state courts and I have testified in over one hundred and thirty-five
31 proceedings before public utility regulators in twenty-four states and the District of

1 Columbia. I also have testified on economic and regulatory issues before the Federal
2 Energy Regulatory Commission.

3
4 I have testified on behalf of state consumer advocates in Maryland, Ohio, Maine, Hawaii,
5 Pennsylvania, and the District of Columbia. My testimony has addressed a wide variety
6 of issues pertaining to wireline telecommunications carriers including: cost of service,
7 revenue requirements, rate design, infrastructure deployment evaluations and service
8 quality.

9
10 On behalf of GTE Corporation, I examined and critically evaluated claims made by
11 AT&T Corporation in its advertising with respect to the reliability of GTE's domestic
12 long distance network. I presented my findings in the form of expert testimony on
13 telecommunications network management and engineering matters before the United
14 States District Court for the Northern District of Dallas in Civil Action No. 3-96-CV-
15 1970-D, GTE Card Services, Incorporated, et al. v. AT&T Corporation.

16
17 On behalf of Sun Company, Inc. (R&M), I presented expert testimony on
18 telecommunications outside plant engineering and administration matters before the
19 Washtenaw County (Michigan) Circuit Court in Case No. 93-689-NZ, Michigan Bell
20 Telephone Company v Sun Company, Inc. (R&M).

21
22 Q. HAVE YOU ANY OTHER PROFESSIONAL EXPERIENCE THAT WOULD BEAR
23 ON THE ISSUES AND TOPICS ABOUT WHICH YOU TESTIFY HERE?

24 A. Yes. My recent experience includes direct line responsibility for management of
25 an operating telephone company in New England. Beginning in October 1997 and
26 continuing through July 2000, in addition to other consulting engagements I was
27 employed in a management consulting capacity with an independent telephone company.
28 I was engaged by the company as a management consultant with the title as Vice
29 President - Operations Research to devote approximately 1,000 hours of my time
30 annually to assist the company's management in rectifying its problems. My duties

1 involved activities that were designed to improve the company's performance with
2 respect to the full range of the company's operations including, *interalia*: engineering,
3 finance and accounting, tariffs and customer billing, business office and customer
4 contact, assignment and repair, inside and outside plant operations and administration,
5 regulatory interaction, general administration (e.g., human resources).

6
7 Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE NEW JERSEY BOARD OF
8 PUBLIC UTILITIES ("NJBPU" OR "THE BOARD")?

9 A. No, I have not.

10
11 Q. ARE YOU FAMILIAR WITH NJBPU DOCKET NO. TO01020095?

12 A. Yes I am. I have reviewed the testimony filed by Verizon witnesses and the Verizon
13 discovery responses to the parties' requests for information. Additionally, I have
14 consulted various publicly-available sources for information pertaining to Verizon,
15 especially to Verizon-New Jersey ("VNJ" or "the Company").

16
17 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AT THIS TIME?

18 A. On behalf of the State of New Jersey, Division of the Ratepayer Advocate, I have
19 critically reviewed the network deployed by VNJ with emphasis on the ways in which
20 that network enables schools and libraries throughout the state to employ modern
21 telecommunications products and services for the benefit of students, school and library
22 administrations, and the public at large. I have also reviewed the terms of the price
23 discounts that Verizon makes available to schools and libraries for their use in purchasing
24 data transport channels. The purpose of my testimony at this time is to present and
25 explain my findings to the Board and to recommend actions that the Board should take to
26 improve the schools' and libraries' access to VNJ's network.

1 Q. PLEASE SUMMARIZE YOUR FINDINGS, CONCLUSIONS AND
2 RECOMMENDATIONS TO THE BOARD.

3 A. Verizon's New Jersey wireline network infrastructure is technologically modern. The
4 Company's network has the capacity to provide a full range of advanced
5 telecommunications products and services to the general body of Verizon's business and
6 residential customers. It is also equipped and configured to accomplish all of the goals of
7 the Opportunity New Jersey ("ONJ") program as modified by the additional requirements
8 of Access New Jersey ("ANJ"), but only to the extent that the intended beneficiaries of
9 ANJ (i.e., schools and libraries in the state) are economically able to take advantage of
10 the program.

11
12 While I found that approximately 98 percent of all New Jersey schools currently have
13 some form of access to the internet,¹ only about 50 percent enjoy such access at
14 wideband² or broadband³ bit transfer rates -- rates that would permit the transmission of
15 virtual full motion interactive video signals.⁴ This is an unacceptable penetration rate
16 given that VNJ has deployed technology sufficient to enable wideband access, or better,
17 to reach all schools in the state.⁵ I conclude that in order to effect improved deployment
18 of wideband and broadband access for schools and libraries, VNJ should increase
19 substantially the level of the discounts from tariff rates at which it offers wideband and
20 broadband access to New Jersey schools and libraries.

¹ New Jersey Department of Education School Technology Survey 2000, p.1.

² Bit transfer rates greater than 144 Kbps but less than 1.544 Mbps.

³ Bit transfer rates greater than 1.544 Mbps.

⁴ New Jersey Department of Education School Technology Survey 2000, Table entitled "Internet Access."

⁵ Verizon "Education Update," Volume 2, Issue 3, Winter 2000 (By the Numbers).

1 Q. WHAT IS YOUR UNDERSTANDING OF THE PROGRAM KNOWN AS
2 OPPORTUNITY NEW JERSEY (“ONJ”)?

3 A. I understand that ONJ is a program of infrastructure and technology improvement
4 commitments that Verizon (f/k/a Bell Atlantic–New Jersey, “BA-NJ”) made as part of its
5 initial proposed Plan for an Alternative Form of Regulation (“Initial Plan”) first filed with
6 the Board in March 1992 and approved by the Board, with modifications, in May 1993.
7 ONJ represented BA-NJ’s plan to accelerate⁶ the deployment of advanced switching and
8 transmission technologies so as to enable Advanced Intelligent Network (“AIN”)⁷ and
9 the full range of digital bandwidth services capabilities (narrowband, wideband and
10 broadband) in its network. BA-NJ estimated that it would expend some \$1.5 billion in
11 new investment to accomplish the goals established for the program through 1999. I
12 understand the original goals of ONJ were as summarized in the following table:

13 Table No. 1
14 Original Goals of ONJ⁸
15
16

Network Capability	Business as Usual Date	ONJ- Accelerated Date
Advanced Intelligent Network	2001	1998
Narrowband Digital Access	2002	1998
Wideband Digital Access	2020-30	2000
Broadband Digital Access	2030	2010

17
18 The Board adopted BA-NJ’s ONJ proposal, without modification, when it approved a
19 modified BA-NJ Plan for an Alternative Form of Regulation.⁹
20

⁶ Relative to “business-as-usual” infrastructure deployment plans.

⁷ The ability of network components (e.g., switches) to access telephone company data bases and/or customer data bases to secure information on how to handle (e.g., route) calls over the network. The ability of the calling and/or called party to direct the network regarding elements of a call (e.g., caller ID).

⁸ NJBPU Decision and Order, dated May 6, 1993, in Docket No. TO92030358, pp. 73, 74.

⁹ Id. at 97.

1 Q. WHAT IS YOUR UNDERSTANDING OF THE PROGRAM KNOWN AS ACCESS
2 NEW JERSEY (“ANJ”)?

3 A. I understand that in October 1997, the Board opened Docket No. TX96100707
4 specifically to investigate BA-NJ’s progress in complying with the terms of ONJ. The
5 Board took evidence and conducted hearings on the issues. After the hearings concluded,
6 BA-NJ, the RPA, and the Board Staff engaged in discussions with the objective of
7 reaching a settlement of the matter. In April 1997, the parties agreed to a settlement and
8 a Stipulation was drawn to memorialize the terms of agreement, and presented to the
9 Board for approval.

10
11 The Stipulation represents a further acceleration of the ONJ goals with ratepayer benefits
12 estimated to total in excess of \$175 million -- \$130 million of which pertains to network
13 enhancements designed to accrue mainly to schools and libraries in the state.¹⁰
14 Specifically, I understand the Stipulation as further expanding the terms of ONJ to
15 include the following objectives pertaining to the state’s schools and libraries:

- 16
17 1. Deploy an Asynchronous Transfer Mode (“ATM”) backbone network in New
18 Jersey by 2001 in order to offer broadband capacity to all schools and libraries
19 within BA-NJ’s operating territory, but enabling all Abbot school districts to be
20 linked by 1999 (estimated value \$55 million);
21 2. Permit those schools that employ BA-NJ’s Interactive Distance Learning Service
22 (“IDLS”) to upgrade to ATM capability without added cost or penalty;¹¹
23 3. Establish a \$25 million fund from which schools and libraries can draw to
24 purchase on-site (schools and libraries) Customer Premises Equipment (“CPE”) with the objective to deploy one fixed and one portable interactive classroom in
25 every school district by 12/31/99; and
26 4. Beginning in September 1997, extend discounted prices (i.e., discounted from
27 tariff prices) to schools and libraries for certain specific selected forms of high bit
28

¹⁰ NJBPU Docket No. TX96100707, ORDER APPROVING STIPULATION (June 10, 1997), p. 7.

¹¹ With a minimum three-year contractual obligation to the upgrade.

1 rate connections to BA-NJ's network – specifically, Integrated Services Digital
2 Network ("ISDN"), Frame Relay ("FR"), Switched Multimegabit Data Service
3 ("SMDS"), and ATM. (estimated value \$50 million).
4

5 I understand the overarching goal of ANJ to be the provision of modern
6 telecommunications technologies (information and video) principally to schools and
7 libraries in the state with particular emphasis on reaching the 28 Abbott school districts.¹²
8

9 In the instant docket, Verizon is proposing to continue the benefits of the ANJ program
10 for schools and libraries by: extending the availability of discounted data transport
11 services; expanding the fund for CPE by approximately \$14 million; and by adding some
12 \$6 million of commitment to support video services.¹³ Verizon does not propose to
13 increase the levels of discounts at which it will provide access to data transport services
14 by schools and libraries.
15

16 Q. MR. WEISS, PLEASE BRIEFLY EXPLAIN EACH OF THE HIGH BIT RATE
17 CONNECTIONS THAT ARE THE SUBJECT OF BENEFITS TO SCHOOLS AND
18 LIBRARIES UNDER THE ANJ PROGRAM.

19 A. Under ANJ, schools and libraries in New Jersey can purchase the full range of Verizon's
20 high bit rate access services at discounted rates: Integrated Services Digital Network
21 ("ISDN"), Frame Relay ("FR"), Switched Multimegabit Data Service ("SMDS") and
22 ATM.
23

24 ISDN is a circuit-switched digital service that is available in two varieties: Basic Rate
25 Interface ("BRI") and Primary Rate Interface ("PRI"). BRI offers two bearer ("B")
26 channels at 64 Kbps each for transporting intelligence and a third 16 Kbps signaling or
27 data ("D") channel that is used to control the various switches on the network as they
28 switch the traffic from the B channels. When it is not being used in the control function,

¹² Docket No. TX-99020050, Testimony of Dr. Jeffrey V. Osowski on behalf of the New Jersey Department of Education, Division of Information and Management Services, p. 4.

¹³ West/Taylor testimony on behalf of Verizon, pp. 24, 25.

1 the D channel can be used as a bearer channel giving a single ISDN-BRI circuit a total
2 bandwidth of 128 Kbps. BRI can be employed in a wide variety of end-user applications,
3 including voice transmission, video teleconferencing, medical image transmission, the
4 delivery of multimedia training sessions, and internet access. Verizon offers ISDN-BRI
5 service to schools and libraries at bit transfer rates ranging up to 128 Kbps (at \$100 per
6 BRI circuit per month – 72 percent discount from tariff rates).¹⁴

7
8 Like BRI, ISDN-PRI is a circuit switched digital service but, with 23 B channels and one
9 D channel, it exhibits much broader total bandwidth than BRI – 1.5 Mbps, which is 64
10 Kbps for each of the 23 B channels and 16 Kbps for the D channel. PRI can be employed
11 to the same end-user applications as BRI but, for the image-related services, with better
12 overall quality. Verizon does not offer ISDN-PRI service to schools and libraries at
13 discounted rates.¹⁵

14
15 FR service is a data switched service in which the data are organized in “packets,”
16 sometimes referred to as frames, each of which contains both data and information on the
17 routing of that data through the network. FR is intended for use primarily in data
18 communications applications, especially LAN-to-LAN¹⁶ internetworking which involves
19 transmission of data in bursts rather than in continuous form. Although FR was
20 developed primarily for pure data transport applications, it can also be used to transport
21 compressed voice and video, but with less efficiency than other transport schemes.
22 Verizon offers FR service to schools and libraries at bit transfer rates ranging from 56
23 Kbps (at \$100 per FR circuit per month – 43 percent discount from tariff rates) to 45
24 Mbps (at \$1,825 per circuit per month – 52 percent discount from tariff rates).¹⁷

14 Verizon web page: www.bellatlantic.com/ba-nj/education/access.htm.

15 Id.

16 “LAN” -- the acronym for Local Area Network.

17 Verizon web page: “www.bellatlantic.com/ba-nj/education/access.htm.”

1 SMDS is a connectionless high speed data transmission service intended for application
2 primarily in LAN-to-LAN connections in metropolitan areas. SMDS assembles data into
3 cells of varying lengths, up to 73,500 bits, and then presents it to the network in packages
4 of varying lengths along with relevant network control information. The advantage of
5 SMDS is that it avoids network congestion (delays) and therefore delivers data to the
6 intended destination in the same form as it was transmitted. SMDS has not been widely
7 accepted, being displaced for the most part by FR and ATM. Verizon offers SMDS
8 service to schools and libraries at bit transfer rates of from 56 Kbps (at \$100 per SMDS
9 circuit per month – 56 percent discount from tariff rates) to 34 Mbps (at \$1,900 per
10 circuit per month – 53 percent discount from tariff rates).¹⁸

11
12 ATM is a protocol independent, cell-switching data transport technology that offers high
13 speed and low latency¹⁹ for the support of data, voice, and video traffic. ATM provides
14 automatic and guaranteed assignment of bandwidth to meet the specific needs of various
15 applications (e.g., voice, video, multimedia, etc.). ATM is ideally suited to supporting
16 multimedia applications. In effect, ATM has become the default standard for equipment
17 vendors, service providers and end-users to implement a wide range of communications
18 applications over wireline networks. Verizon offers ATM access service to schools and
19 libraries at bit transfer rates of from 1.5 Mbps (at \$400 per circuit per month – 33 percent
20 discount from tariff rates) to 155 Mbps (at \$4,000 per circuit per month – 57 percent
21 discount from tariff rates).²⁰

- 22
23 Q. WHAT DO YOU UNDERSTAND TO BE THE STATE'S OBJECTIVE WITH
24 REGARD TO INTERACTIVE VIDEO SERVICE FOR SCHOOLS AND LIBRARIES?
25 A. I understand that it is an objective of the state to enable a ubiquitous distance learning
26 capability grounded in an interactive video network that is broadly accessible by schools
27 and libraries throughout New Jersey.

¹⁸ Id.

¹⁹ A network term for waiting time or time delay.

²⁰ Verizon web page: "www.bellatlantic.com/ba-nj/education/access.htm."

1 Q. IS IT YOUR UNDERSTANDING THAT VERIZON HAS THE CAPABILITY TO
2 OFFER SUCH SERVICE TO SCHOOLS AND LIBRARIES?

3 A. Yes. I understand that Verizon has developed and deployed a video portal that conforms
4 to that objective. The backbone of that network is a series of three (3) ATM switches
5 located in Newark, Atlantic City, and Mt. Laurel, and accessible from each of the state's
6 Local Access and Transport Areas ("LATAs").²¹ The switches are interconnected
7 through Verizon's high speed digital/optical fiber-ring based interoffice network.
8 Associated with each switch is the video gateway equipment that enables the video
9 conferencing capability that is central to dial-up access to interactive distance learning.²²
10 No charges are assessed to schools and libraries for their use of the video portal. Schools
11 and libraries achieve access to the video portal network by purchasing, at a discount from
12 tariff rates, one or more of Verizon's digital access services at bit transfer rates ranging
13 from 384 Kbps (ISDN) through 155Mbps (OC3 ATM).

14
15 Access to the video portal can be achieved via ISDN through a dial-up connection at the
16 minimum rate of 128 Kbps, a bit transfer rate that results in a low resolution video
17 presentation. Somewhat higher resolution video presentations can be achieved using
18 three ISDN Basic Rate Interface ("BRI") access lines (384 Kbps). ISDN transports only
19 "compressed" video signals that conform to the H.320 video conferencing standard.²³
20 Using ISDN, schools and libraries receive video portal access at prices that reflect the
21 ANJ discounts but, unlike higher forms of data access under terms of ANJ, access to the
22 video portal using ISDN requires schools and libraries to pay for network usage on an
23 incremental basis (i.e., per minute of use). I understand that ANJ discounted charges to

²¹ When the video portal network was first introduced in NJ, the state was divided into only three (3) LATAs; today NJ is divided into six (6) LATAs.

²² The video portal is intended to replace Verizon's IDLS offering. However, existing IDLS users continue to be supported, but no new IDLS arrangements will be added.

²³ "Compressed" video is a television signal transmitted at a rate that is much slower than the usual full motion rate (standard broadcast quality video requires between 45 Mbps and 90 Mbps); signal is "compressed" by eliminating strings of data that do not change in successive video frames (e.g., the background set in the evening news broadcast). H.320 is the most common International Telecommunications Union ("ITU") videoconferencing standard. H.320 exhibits a generally acceptable graphic presentation in which forms are recognizable but detail and motion fidelity are lacking.

1 schools and libraries for ISDN service are \$100.00 per line per month, including 300
2 hours of usage per line; for ISDN usage in excess of 300 hours, standard usage rates
3 apply.
4

5 Access to the video portal at bit transfer rates in excess of 384 Kbps is provided most
6 efficiently at 1.544 Mbps and higher (a/k/a T1 or DS1). Schools and libraries that enjoy
7 access at these higher bit transfer rates establish connections to the video portal through a
8 Permanent Virtual Circuit (“PVC”) – a pre-established path to the video hub located in
9 the school district and then on to the video portal network. Virtual “full motion” video
10 images²⁴ can be achieved at these higher bit transfer rates. I understand that for schools
11 and libraries, 1.5 Mbps transport to the video portal involves monthly charges of \$400.00,
12 representing a discount of 33 percent from Verizon’s tariff rate for 1.5 Mbps ATM
13 service.
14

15 Q. IS VERIZON’S NETWORK IN NEW JERSEY DEVELOPED AND EQUIPPED TO
16 MEET THE OBJECTIVES OF ANJ?

17 A. Yes. All Verizon central offices and wire centers in New Jersey are equipped to provide
18 digital switching and Common Channel Signaling (“CCS”)²⁵; and all exhibit Advanced
19 Intelligent Network (“AIN”) capability. ATM and fast packet switching are deployed so
20 as to enable the movement of data at high bit transfer rates virtually anywhere in the
21 state. Interoffice transport is accomplished with a high speed digital multiplexing
22 equipment operating over optical fiber cable network with the ability to sense problems
23 and failures without human intervention, and to correct them automatically without the
24 loss of messages or data (i.e., the self-healing capability of fiber “ring” networks). At the
25 close of 1999, all access lines in the state could receive at least narrowband service.²⁶

²⁴ ITU standards H.321 (adaptation of the H.320 standard to the ATM environment) and H.322 (guaranteed high quality video).

²⁵ The network architecture that uses the Signaling System 7 (“SS7”) protocol for exchange of information between switches and other network nodes on an out-of-band basis (i.e., using channels separate and apart from message channels to convey network supervisory, network address, and network advisory signals).

²⁶ For purposes of this testimony, narrowband access is defined as access at bit rates of 144 Kbps or slower.

1 Wideband²⁷ access was available to nearly all lines (95 percent) by the close of 2000. In
2 summary, as the result of the ONJ program, Verizon's New Jersey network infrastructure
3 is fully ready and able to provide high-speed network access for schools and libraries at
4 virtually any bit transfer rate that they may require.

5
6 Q. TO WHAT EXTENT ARE SCHOOLS AND LIBRARIES IN NEW JERSEY MAKING
7 USE OF VERIZON'S MODERN NETWORK FOR DATA TRANSPORT UNDER
8 TERMS OF THE ANJ PROGRAM?

9 A. According to Verizon, schools and libraries in New Jersey are using approximately 2,700
10 data circuits at discounted prices under the ANJ program. Service is taken within the full
11 range of bit transfer rates from 128 Kbps ISDN through OC3 SONET. By far the most
12 extensively employed service is ATM at 1.5 Mbps.²⁸

13
14 According to the New Jersey Department of Education, Office of Educational
15 Technology, fully ninety-eight percent (98%) of all schools in the state are connected to
16 the internet; however, only 72 percent of those schools' classrooms are equipped with
17 internet connections. Verizon reports that schools are the most prolific users of data
18 transport services, consuming over 83 percent of the total number of circuits provided at
19 discounted prices under the ANJ program.²⁹ Schools consume data access services at all
20 bit transfer rates, but most often at 128 Kbps ISDN and 1.5 Mbps ATM.³⁰ This is the
21 expected pattern of consumption by schools given that they are involved most heavily in
22 access to the Verizon video portal where the picture quality depends on data delivered at
23 constant bit rates.

24

²⁷ Bit transfer rates greater than 144 Kbps and less than or equal to 1.544 Mbps.

²⁸ Verizon Response to RPA Information Request No. 153(a).

²⁹ Id.

³⁰ Id.

1 Libraries, on the other hand, consume data transport services most often (in over 93
2 percent of the cases) using Frame Relay services at both narrowband (56 Kbps, 64 Kbps)
3 and wideband (1.5 Mbps) bit transfer rates.³¹ This is the expected pattern for libraries
4 that are not necessarily involved with the video portal but rather in transmitting text or
5 numeric information where constant bit rates are not critical.

6
7 Q. WHAT DO YOU CONCLUDE FROM THE FACT THAT, WHILE 98 PERCENT OF
8 SCHOOLS AND LIBRARIES IN THE STATE HAVE INTERNET ACCESS, ONLY 71
9 PERCENT OF THE CLASSROOMS ARE EQUIPPED WITH INTERNET
10 CONNECTIONS?

11 A. The fact that the rate of classroom connection lags behind the rate of school connection
12 can indicate that schools do not have the resources to effect the classroom connections. It
13 may be that physical connection is difficult to accomplish and/or it could be that
14 bandwidth is simply not available to allow several classrooms to access the network
15 simultaneously. In either case, the lack of facilities could be rectified with additional
16 funds.

17
18 Q. IN YOUR OPINION, WOULD SCHOOLS BENEFIT BY EXPANDING THE
19 AVAILABILITY OF DATA ACCESS TO ALL CLASSROOMS?

20 A. Yes. If the schools could broaden the size of the data “pipes” (i.e., the data services to
21 which schools and libraries subscribe under the ANJ program) through which they
22 connect to the network, then more students could simultaneously have access to internet
23 and to the Verizon video portal. The “pipes” can be broadened if schools and libraries
24 can purchase more of the circuits (physical and virtual) that they currently consume or by
25 widening the bandwidth of the “pipes” that are available to them under ANJ. Of course,
26 even under the discounted prices by which Verizon currently offers schools and libraries
27 access to data services, it is difficult for the state’s schools and libraries to budget the
28 funds that would be necessary to achieve this goal.

29

31 Id.

Q. WHAT IS YOUR UNDERSTANDING OF THE PRICING STRUCTURE AT WHICH SCHOOLS AND LIBRARIES IN NEW JERSEY CAN ACHIEVE HIGH SPEED DATA ACCESS UNDER THE TERMS OF THE ACCESS NEW JERSEY PROGRAM?

A. I understand that Verizon offers data network access to schools and libraries in New Jersey according to the prices shown in the following table:

Table No. 2
Data Service Prices to Schools and Libraries Under the ANJ Program³²

Service	Bandwidth (Kbps)	Tariff Rate	ANJ Rate	Disc. (%)
ISDN	Up to 128	\$360.00	\$100.00	72
Frame Relay	56	\$175.00	\$100.00	43
	1,500	\$435.00	\$300.00	31
	4,000	\$2,300.00	\$1,325.00	42
	6,000	\$2,600.00	\$1,425.00	45
	22,000	\$3,000.00	\$1,625.00	46
	45,000	\$3,800.00	\$1,825.00	52
SMDS	56	\$225.00	\$100.00	56
	1,500	\$570.00	\$350.00	39
	4,000	\$2,000.00	\$1,350.00	33
	10,000	\$2,500.00	\$1,450.00	42
	16,000	\$3,000.00	\$1,650.00	45
	25,000	\$3,500.00	\$1,850.00	47
	34,000	\$4,000.00	\$1,900.00	53
ATM	1,500	\$600.00	\$400.00	33
	10,000	\$3,700.00	\$1,800.00	51
	45,000	\$4,450.00	\$2,500.00	44
	OC3 – DF	\$6,500.00	\$3,000.00	54
	OC3 – SON	\$9,200.00	\$4,000.00	57

From the table, it is interesting to note that those services most frequently used by schools exhibit the smallest percentage discount – 1.5 Mbps services consistently exhibit discounts of about 30 percent as opposed to much higher discounts for less-demanded

1 slower bit rate services such as ISDN and much higher bit rate services such as 45 Mbps
2 FR. Also of note from the table is that ATM and FR services as a group tend to exhibit
3 lower discount rates than the other types of data transport services at similar bit rates –
4 for example, see 1.5 Mbps ATM (33 percent discount) or 1.5 Mbps FR (31 percent
5 discount) as compared to 1.5 Mbps SMDS (39 percent discount). As described earlier,
6 ATM and FR services are most used by schools and libraries, respectively.

7
8 Q. WHAT ACTION SHOULD THE BOARD TAKE TO HELP THE STATE'S SCHOOLS
9 AND LIBRARIES ACHIEVE MORE EFFECTIVE ACCESS TO THE DATA
10 NETWORKS AND TO VERIZON'S VIDEO PORTAL?

11 A. The Board should require Verizon to substantially increase the levels of discounts at
12 which schools and libraries have access to data transport. Such action would go a long
13 way toward lowering the economic barrier to expanded access by schools and libraries. I
14 recommend that the Board emphasize increasing the levels of discounts applicable to all
15 of the data transport currently services currently and most frequently used by schools and
16 libraries with particular emphasis on the prices charged to schools and libraries for high
17 bit rate services that are best adapted for to the video applications – 1.5 Mbps and 45
18 Mbps ATM service.

19
20 Q. WHAT LEVELS OF DISCOUNTS SHOULD THE BOARD NOW REQUIRE
21 VERIZON TO APPLY TO THE PRICES OF DATA ACCESS BY SCHOOLS AND
22 LIBRARIES?

23 A. As I observed earlier, ATM service at the bit transfer rate of 1.5 Mbps is highly
24 demanded by the schools. However, because of restrictions on their resources, schools in
25 many cases must settle for other, slower alternative means of data transport, such as
26 ISDN. Although ISDN is certainly capable of transporting data at continuous bit rates
27 (like ATM), ISDN bit transfer rates are not conducive to the presentation of full motion
28 video. Thus, at a minimum, in order to improve the quality of the video service available

³² Verizon web page: "www.bellatlantic.com/ba-nj/education/access.htm."

1 to schools (and thereby the utility of video presentations as a teaching tool), 1.5 Mbps
2 ATM transport should become more affordable for them.

3
4 Schools and libraries both employ data transport services to send text and numeric data in
5 various applications, and the efficiency of such transport is improved with increasing bit
6 transfer rates. Again, however, schools and libraries both are constrained by restricted
7 resources in their use of bit rate services that exhibit rates in excess of 1.5 Mbps. The
8 ability of both schools and libraries to use such faster data transport would certainly
9 improve their efficiency; for example, schools could employ a single 45 Mbps pipe to
10 access the network and with that pipe, they could transfer several forms of video, text and
11 numeric information simultaneously. Libraries could relax their dependence on ISDN
12 and FR service to the same end – the simultaneous transport several information forms –
13 with the result that libraries can become a valuable additional extension of the
14 information age learning experience. To effect these benefits, the Board should require
15 Verizon to increase the amounts of the discounts applicable to 1.5 Mbps and 45 Mbps
16 ATM transport services.

17
18 Q. BY WHAT AMOUNTS DO YOU RECOMMEND THAT THE BOARD INCREASE
19 THE ANJ PROGRAM DISCOUNTS APPLICABLE TO 1.5 MBPS AND 45 MBPS
20 ATM ACCESS?

21 A. As shown in Table No. 2, which I presented earlier, currently Verizon offers price
22 discounts in the amounts of \$200.00 per access channel per month from the tariff rate for
23 an ATM 1.5 channel, and \$1,950.00 per access channel per month from the tariff rate for
24 an ATM 45 channel (the equivalent of fifteen ATM 1.5 channels). I recommend that the
25 Board increase these discounts by amounts that would encourage schools and libraries to
26 deploy ATM 1.5 and ATM 45 services in lieu of the FR and SMDS channels that they
27 currently use at or near the same bit transfer rates. The price of an ATM 1.5 channel
28 should be discounted by an additional \$150.00 monthly from the \$400.00 to \$250.00
29 (constituting a 58.3 percent discount from current \$600.00 tariff price); the price of ATM

1 45 should be discounted by an additional \$645.00 monthly from \$2,500.00 to \$1,855.00
2 (also constituting a 58.3 percent discount from current \$4,450.00 tariff price).

3
4 The proposed increased discounts will provide schools and libraries with the fiscal
5 incentive to obtain higher grade digital access services at reduced costs. Discounts in the
6 amounts recommended for an ATM 1.5 channel will bring the price of the ATM 1.5
7 channel to a level which is \$100.00 per month less than the comparable SMDS channel
8 and \$50.00 per month less than the comparable FR channel. Thus, in each case, the
9 schools and libraries will have an economic incentive to opt for the ATM 1.5 channel
10 over either alternative and they will enjoy better quality with greater overall flexibility.

11
12 Discounts in the amounts recommended for an ATM 45 channel will bring the price of
13 the ATM 45 channel to a level which is \$25.00 per month less than the nearest
14 comparable SMDS channel (34 Mbps) and only \$25.00 per month more than the
15 comparable FR channel. Thus and again, in each case, the schools and libraries will have
16 an economic incentive to opt for the ATM 45 channel over either alternative and, as with
17 ATM 1.5, they will enjoy better quality service with greater overall flexibility.

18
19 Q. IN ACCEPTING YOUR RECOMMENDATION, BY APPROXIMATELY HOW
20 MUCH WOULD THE BOARD INCREASE THE TOTAL AMOUNT OF VERIZON
21 DISCOUNTS TO SCHOOLS AND LIBRARIES?

22 A. Earlier, I noted that under the terms of the original ANJ program, Verizon estimated that
23 its proposed discounts from tariff rates for data transport channels would total some \$50
24 million over the four-year period³³ beginning in September 1997 – approximately \$12.5
25 million per year. Given the current size of the schools and libraries market for discounted
26 high bit transfer rate services,³⁴ I estimate the additional value of my proposals to total

³³ Docket No. TX96100707, Stipulation, p. 1.

³⁴ Verizon Response to RPA Information Request No. 153(a).

1 approximately \$3.0 million annually – a 24 percent increase in the value of the discount
2 program.³⁵ The estimate is based on the assumption that schools and libraries currently
3 subscribing to wideband FR service would migrate from FR to ATM and that those
4 schools and libraries that currently subscribe to ATM service would continue to do so but
5 at the higher bit transfer rates than they currently use (i.e., the estimate is conservative in
6 assuming that no migration from ATM 1.5 to ATM 45 would take place). I estimate that
7 my recommendations would produce additional discounts totaling some \$21 million for
8 schools and libraries through the year 2007 proposed by Verizon for the sunset of its
9 proposals in the instant case. However, I do not propose that such a program sunset in
10 the year 2007; instead, the funding should continue until there is a Board determination
11 that there is no longer a need for continued funding.

12
13 Q. MR. WEISS, HAVE YOU MADE ANY EFFORT TO DETERMINE WHETHER THE
14 ADDITIONALLY DISCOUNTED PRICES THAT YOU RECOMMEND FOR ATM
15 1.5 CHANNELS AND ATM 45 CHANNELS FALL BELOW VERIZON'S
16 INCREMENTAL COST TO PROVIDE THE CHANNELS?

17 A. Yes. I have determined the incremental cost that Verizon incurs to provide both services
18 by estimating the cost that Verizon would avoid if an additional increment of either is not
19 offered. My findings are based on a 9.50 percent weighted cost of capital, service lives
20 of 11 years and 24 years for digital circuit equipment and cable, manufacturer-suggested
21 prices for digital circuit equipment and cable, and annual maintenance factors of 1.2
22 percent (of gross investment) for digital circuit equipment and 13.75 percent for cable.³⁶
23 The computations show that Verizon's incremental cost of DS1-capable access (1.5
24 Mbps) is approximately \$42.00 monthly; for DS3-capable access (45 Mbps), I found
25 Verizon's incremental cost at \$440.00 monthly. These figures constitute Verizon's price
26 floor for the services and they represent the price above which Verizon receives a
27 contribution to help cover its common costs of doing business. From these figures, it is

³⁵ Estimate based on Verizon's response to RPA Information Request No. 153(a).

³⁶ Findings recommended on behalf of the Rhode Island Division of Public Utilities and Carriers by T. H. Weiss and adopted by the Rhode Island PUC in RIPUC Docket No. 2861 as applicable to Verizon operations in Rhode Island.

1 clear that by adopting my recommended discounted monthly prices for ATM 1.5
2 channels and for ATM 45 channels, the Board would not be forcing Verizon to offer
3 either discounted service to schools and libraries at a loss.

4

5 Q. DOES THAT CONCLUDE YOUR TESTIMONY AT THIS TIME?

6 A. Yes, it does.